K.S.K COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Optimizing User, Group, and Role Management with Access Control and Workflows.

Team ID : NM2025TMID01445

Team Size : 4

Team Leader : Arjun T[821022104009]

Team member : Matheshkumar R [821022104030]

Team member : Jawahar M S[821022104021]

Team member : Hariharan R [821022104015]

PROBLEM STATEMENT:

In large organizations, managing users, groups, and roles manually often leads to security risks, access conflicts, and inefficient workflows. Without a structured access control mechanism, ensuring data privacy and task accountability becomes challenging.

There is a strong need for an automated and secure system that can handle user, group, and role management efficiently while integrating approval workflows and access controls.

OBJECTIVE:

To develop a *ServiceNow-based system* that simplifies and automates *user, group, and role management* with *role-based access control (RBAC)* and *workflow automation*, ensuring proper authorization, efficient task assignment, and secure data handling.

SKILLS:

* ServiceNow Application Development

* User, Group, and Role Management

* Access Control Lists (ACL) Configuration

* Flow Designer & Workflow Automation

* Business Rules and Client Scripts

* Testing, Debugging, and Documentation

TASK INITIATION:

The project ***"Optimizing User, Group, and Role Management with Access Control and Workflows"*** was initiated to create a *secure and automated environment* for managing user permissions and workflows.

The main idea was to reduce manual access management by integrating *automatic role assignment, **group-based access, and **workflow approvals* through ServiceNow.

Key goals were defined as:

* Strengthen data security using ACLs

* Streamline the workflow for user requests

* Minimize admin overhead through automation

FEATURES:

* **User Management:** Create and manage user records with unique roles and credentials.

* **Group Management**: Organize users into functional teams or departments.

* **Role-Based Access Control:** Assign and restrict access based on specific roles.

* **Automated Workflows:** Enable request and approval flows for new access or updates.

* **Notification System:** Trigger automated email updates when access or status changes.

* **Data Security:** Implement ACLs to protect sensitive information.

* **Efficiency Tracking:** Monitor and analyze workflow performance and user access requests.

Modules Implemented :

1. **User Creation:**

Created multiple user profiles representing employees, managers, and administrators.

Each user has predefined credentials and mapped roles.

2. **Group Creation:**

Configured different groups (e.g., HR Team, IT Support, Admins) to organize users and enable collective access permissions.

3. **Role Management:**

Defined custom roles (e.g., approver, admin, requester) to control module-level access and restrict unauthorized actions.

4. **Table Creation:**

Developed custom tables to store user and access data.

Fields include User ID, Group Name, Role Type, Status, and Approval Stage.

5. **Role & User Assignment:**

Assigned roles to users and groups, ensuring that each individual's access matched their organizational responsibility.

6. **Table Role Assignment:**

Controlled permissions at the table level so that only specific roles could read, write, or modify records.

7. **Access Control List (ACL):**

Configured ACLs to protect records based on conditions, roles, and scripts.

This ensures only authorized users can view or update sensitive data.

8. Workflow & Outputs:

Designed approval workflows through Flow Designer.

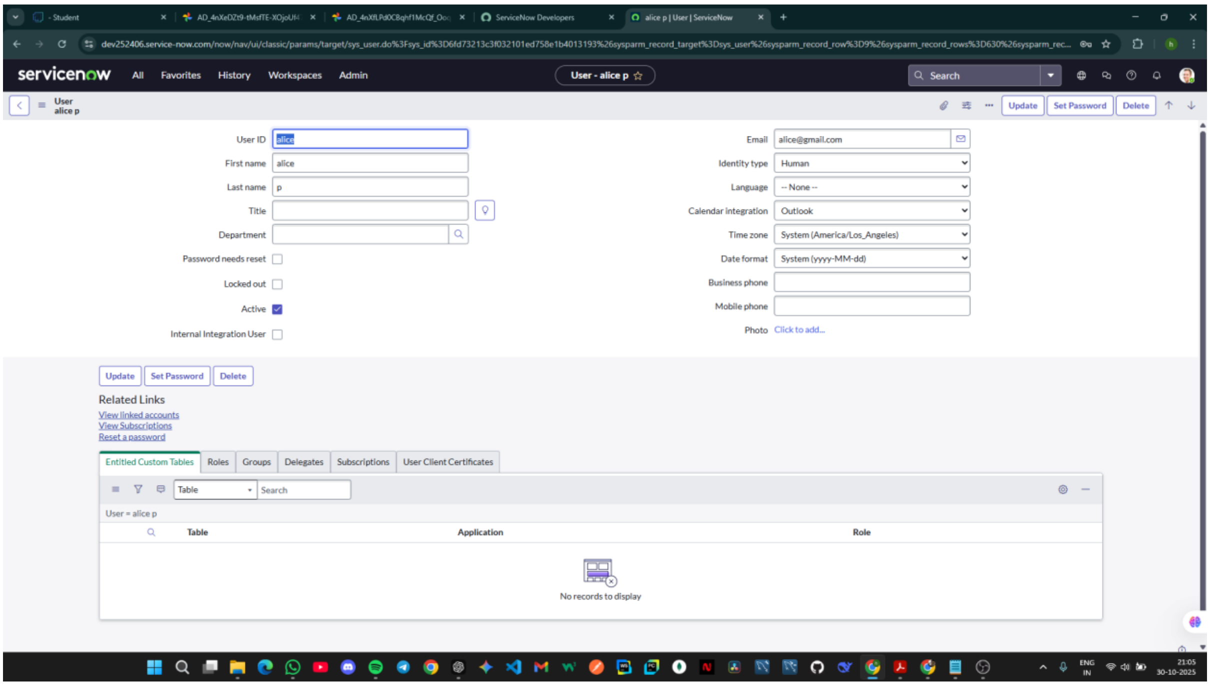
When a new user requests access or role update:

* Request is automatically routed to the manager..
* Upon approval, the user is assigned the role.

* Notifications and task updates are triggered automatically.

IMPLEMENTATION STEPS:

STEP 1: CREATE USERS



User
alice p

User ID	alice	Email	alice@gmail.com
First name	alice	Identity type	Human
Last name	p	Language	-- None --
Title		Calendar integration	Outlook
Department		Time zone	System (America/Los_Angeles)
Password needs reset	□	Date format	System (yyyy-MM-dd)
Locked out	□	Business phone	
Active	☑	Mobile phone	
Internal Integration User	□	Photo	Click to add...

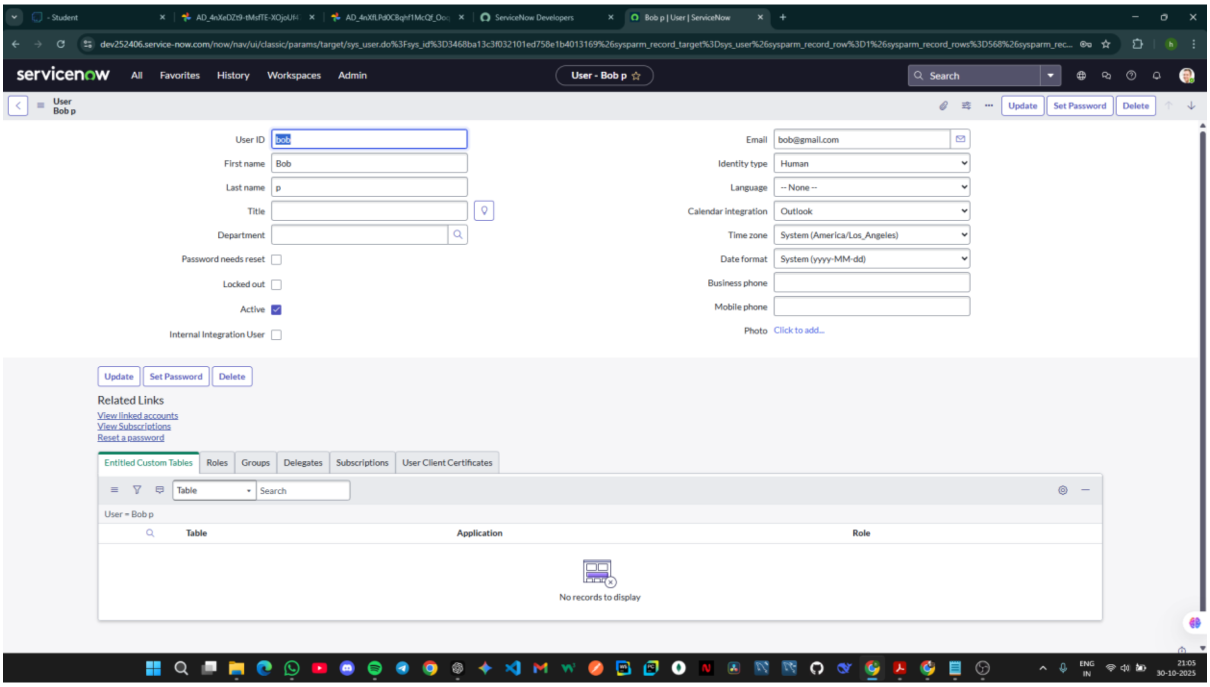
Related Links
View linked accounts
View Subscriptions
Reset a password

Entitled Custom Tables | Roles | Groups | Delegates | Subscriptions | User Client Certificates

User = alice p

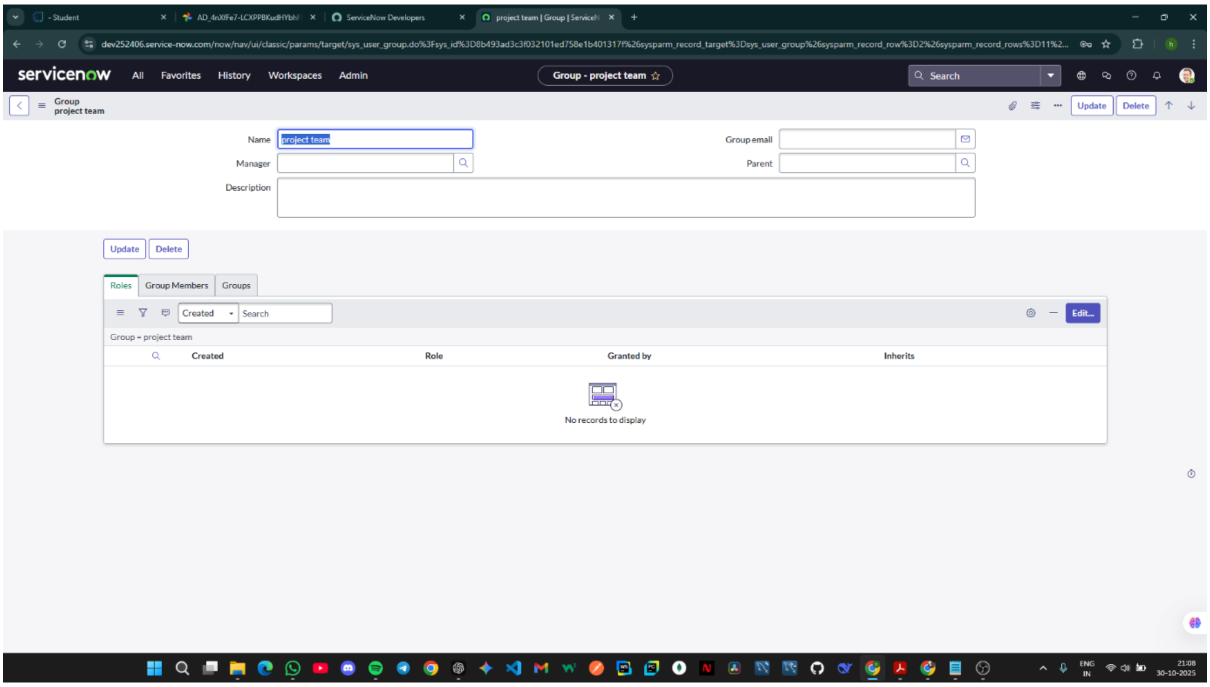
Table	Application	Role

No records to display

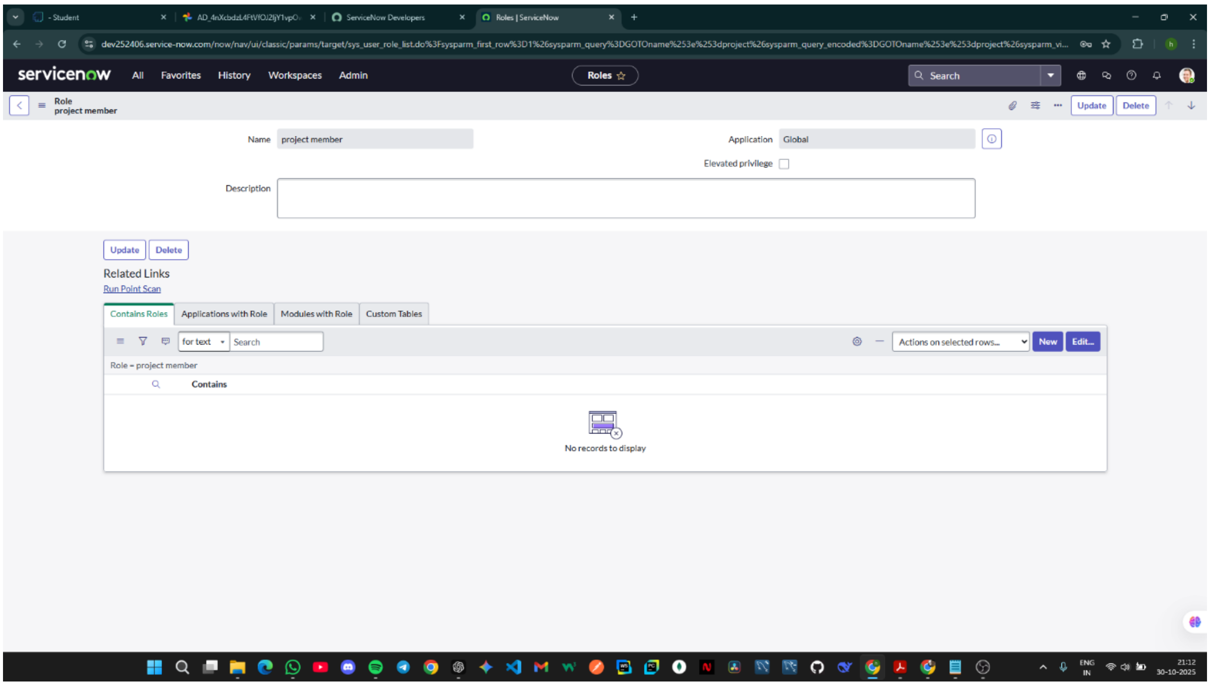


User ID	bob	Email	bob@gmail.com
First name	Bob	Identity type	Human
Last name	p	Language	-- None --
Title		Calendar integration	Outlook
Department		Time zone	System (America/Los_Angeles)
Password needs reset	□	Date format	System (yyyy-MM-dd)
Locked out	□	Business phone	
Active	☑	Mobile phone	
Internal Integration User	□	Photo	Click to add...

STEP 2: CREATE GROUPS



Name	project team	Group email	
Manager		Parent	
Description			



dev252406.service-now.com/now/nav/ui/classic/params/target/sys_user_role_list.do%3Fsysparm_first_row%3D1%26sysparm_query%3DGOTOname%253e%253dproject%26sysparm_query_encoded%3DGOTOname%253e%253dproject%26sysparm_vi...

Role
project member

Name: project member

Application: Global

Elevated privilege ☐

Description:

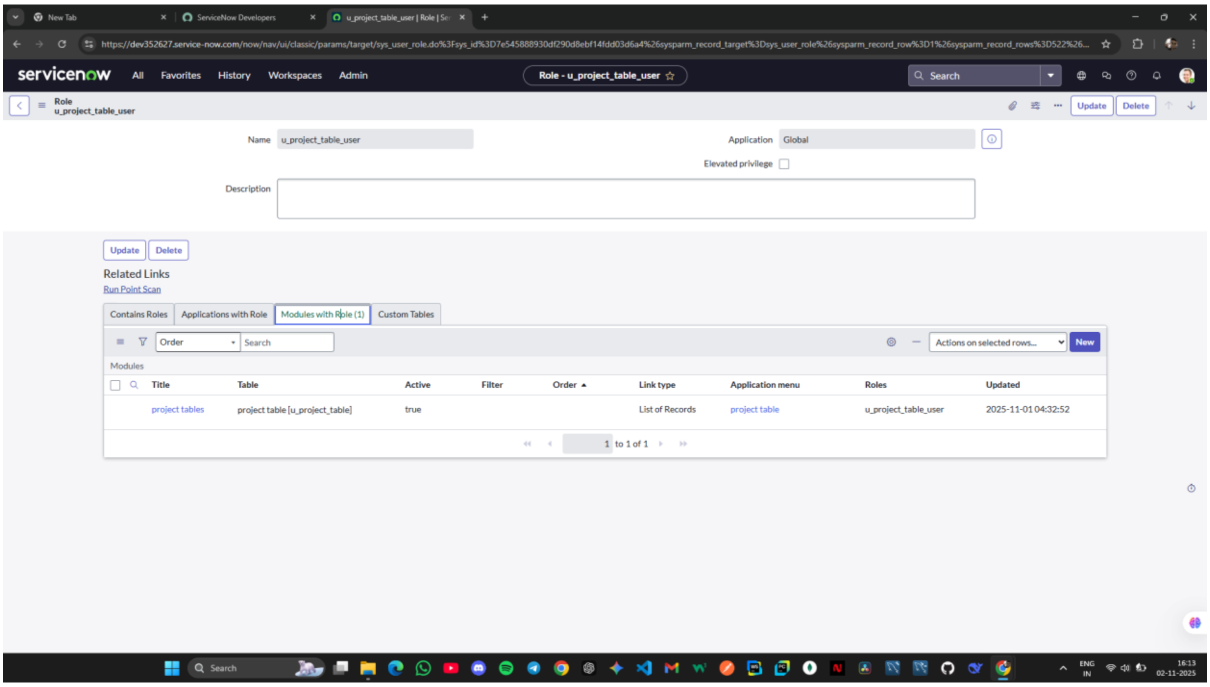
Related Links
Run Point Scan

Role = project member

Contains

No records to display

STEP 3: CREATE ROLES



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_user_role.do%3Fsys_id%3D7e545888930df290d8ebf14fdd03d6a4%26sysparm_record_target%3Dsys_user_role%26sysparm_record_row%3D1%26sysparm_record_rows%3D522%26...

Role
u_project_table_user

Name: u_project_table_user

Application: Global

Elevated privilege ☐

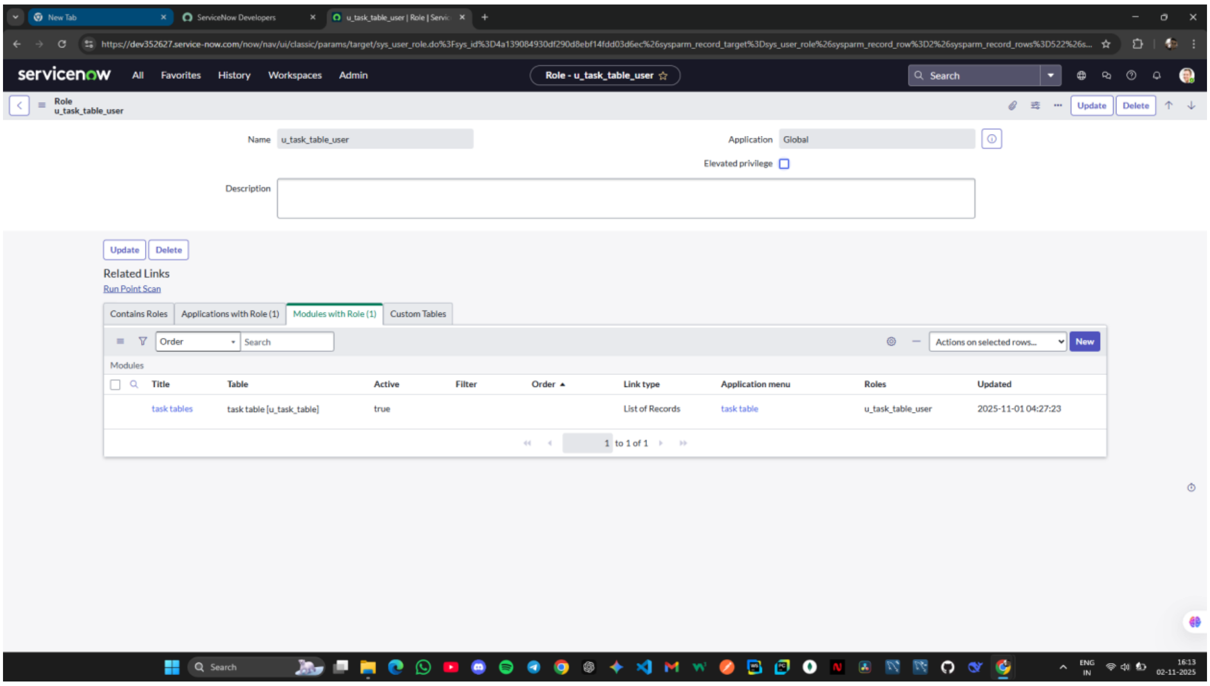
Description:

Related Links
Run Point Scan

Modules

Title	Table	Active	Filter	Order ▲	Link type	Application menu	Roles	Updated
project tables	project table [u_project_table]	true			List of Records	project table	u_project_table_user	2025-11-01 04:32:52

1 to 1 of 1



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_user_role.do%3Fsys_id%3D4a139084930df290d8ebf14fdd03d6ec%26sysparm_record_target%3Dsys_user_role%26sysparm_record_row%3D2%26sysparm_record_rows%3D522%26s...

Role - u_task_table_user

Role
u_task_table_user

Name: u_task_table_user

Application: Global

Elevated privilege: □

Description:

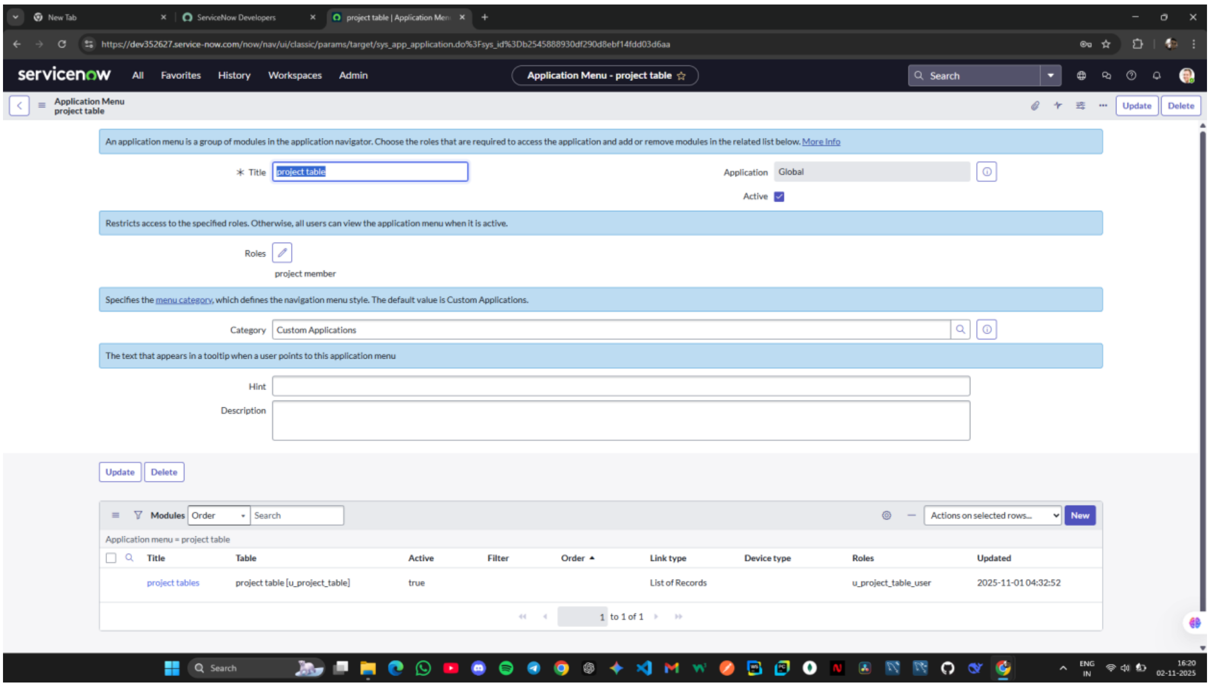
Related Links
Run Point Scan

Modules

Title	Table	Active	Filter	Order ▲	Link type	Application menu	Roles	Updated
task tables	task table [u_task_table]	true			List of Records	task table	u_task_table_user	2025-11-01 04:27:23

1 to 1 of 1

STEP 4: CREATE TABLES



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3Db2545888930df290d8ebf14fdd03d6aa

Application Menu - project table

Application Menu
project table

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. More Info

* Title: project table

Application: Global

Active: ☑

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles: project member

Specifies the menu category, which defines the navigation menu style. The default value is Custom Applications.

Category: Custom Applications

The text that appears in a tooltip when a user points to this application menu

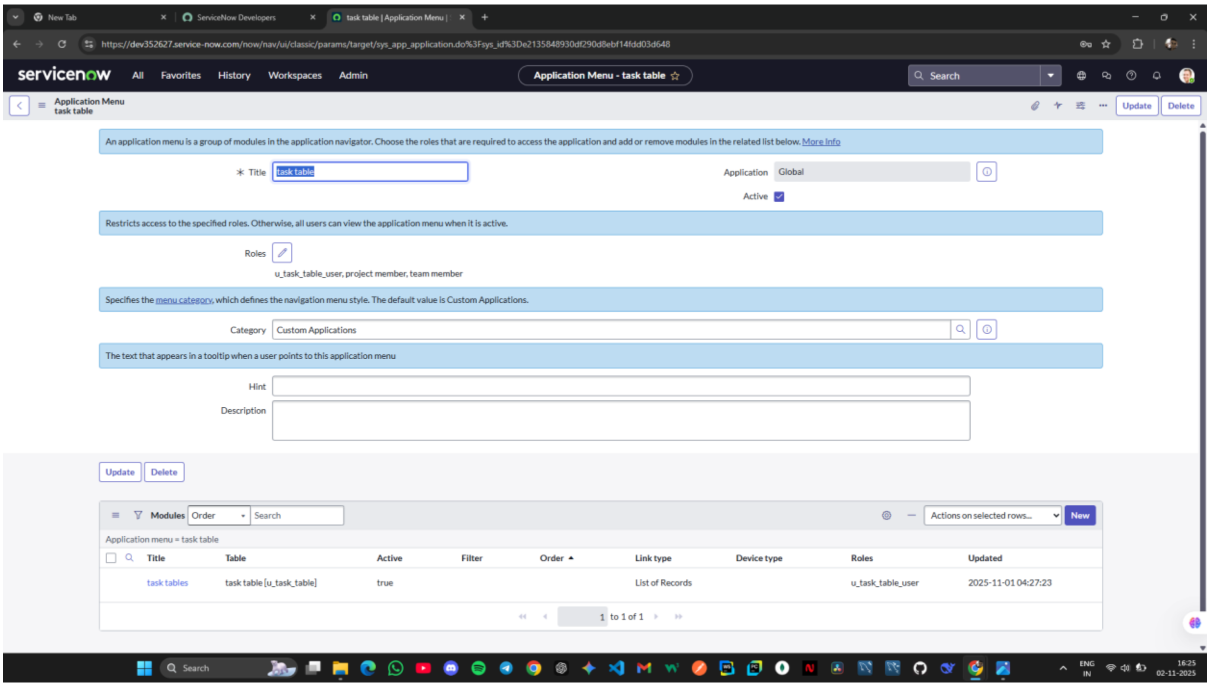
Hint:

Description:

Application menu = project table

Title	Table	Active	Filter	Order ▲	Link type	Device type	Roles	Updated
project tables	project table [u_project_table]	true			List of Records		u_project_table_user	2025-11-01 04:32:52

1 to 1 of 1


New Tab
ServiceNow Developers
task table | Application Menu |
https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3De2135848930df290d8ebf14fdd03d648
servicenow
All
Favorites
History
Workspaces
Admin
Application Menu - task table ☆
Search
Application Menu
task table
Update
Delete

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. More Info

✱ Title	task table	Application	Global
		Active	☑

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles: u_task_table_user, project member, team member

Specifies the menu category, which defines the navigation menu style. The default value is Custom Applications.

Category: Custom Applications

The text that appears in a tooltip when a user points to this application menu

Hint:

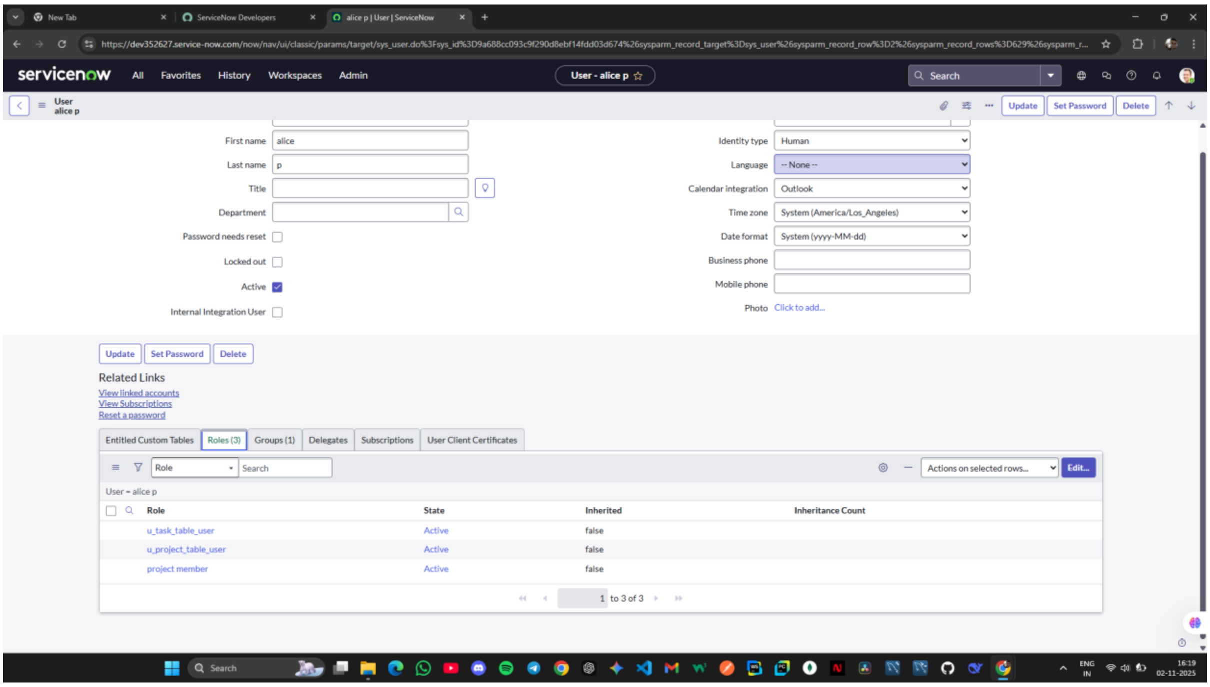
Description:

Application menu = task table

Title	Table	Active	Filter	Order ▲	Link type	Device type	Roles	Updated
task tables	task table [u_task_table]	true			List of Records		u_task_table_user	2025-11-01 04:27:23

1 to 1 of 1

STEP 5: ASSIGN ROLES & USERS TO GROUPS


New Tab
ServiceNow Developers
alice p | User | ServiceNow
https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_user.do%3Fsys_id%3D9a688cc093c9f290d8ebf14fdd03d674%26sysparm_record_target%3Dsys_user%26sysparm_record_row%3D2%26sysparm_record_rows%3D629%26sysparm_r...
servicenow
All
Favorites
History
Workspaces
Admin
User - alice p ☆
Search
User
alice p
Update
Set Password
Delete

First name	alice	Identity type	Human
Last name	p	Language	-- None --
Title		Calendar integration	Outlook
Department		Time zone	System (America/Los_Angeles)
Password needs reset	□	Date format	System (yyyy-MM-dd)
Locked out	□	Business phone	
Active	☑	Mobile phone	
Internal Integration User	□	Photo	Click to add...

Update
Set Password
Delete

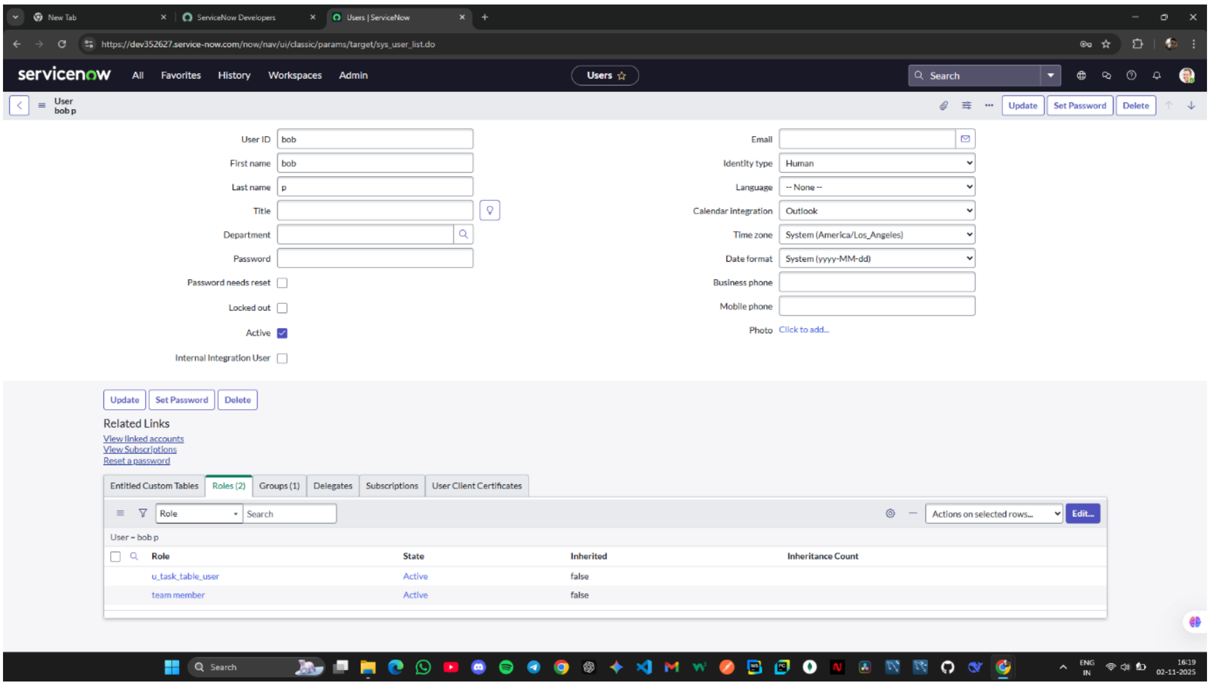
Related Links

View linked accounts
View Subscriptions
Reset a password

User = alice p

Role	State	Inherited	Inheritance Count
u_task_table_user	Active	false	
u_project_table_user	Active	false	
project member	Active	false	

1 to 3 of 3



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_user_list.do

User
bob p

User ID	bob	Email	
First name	bob	Identity type	Human
Last name	p	Language	-- None --
Title		Calendar integration	Outlook
Department		Time zone	System (America/Los_Angeles)
Password		Date format	System (yyyy-MM-dd)
Password needs reset	□	Business phone	
Locked out	□	Mobile phone	
Active	☑	Photo	Click to add...
Internal Integration User	□		

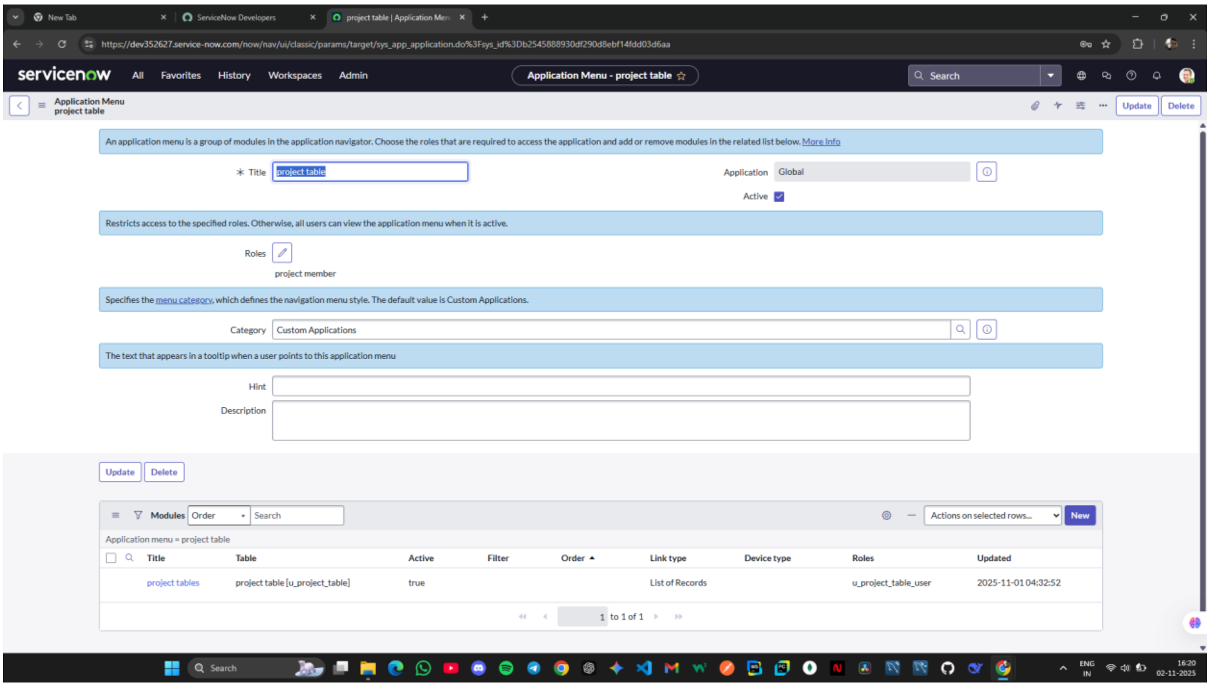
Related Links
View linked accounts
View Subscriptions
Reset a password

Entitled Custom Tables | Roles (2) | Groups (1) | Delegates | Subscriptions | User Client Certificates

User = bob p

Role	State	Inherited	Inheritance Count
u_task_table_user	Active	false	
team member	Active	false	

STEP 6: ASSIGN ROLES TO TABLE



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3Db2545888930df290d8ebf14fdd03d6aa

Application Menu
project table

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. More Info

* Title	project table	Application	Global
		Active	☑

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles: project member

Specifies the menu category, which defines the navigation menu style. The default value is Custom Applications.

Category: Custom Applications

The text that appears in a tooltip when a user points to this application menu

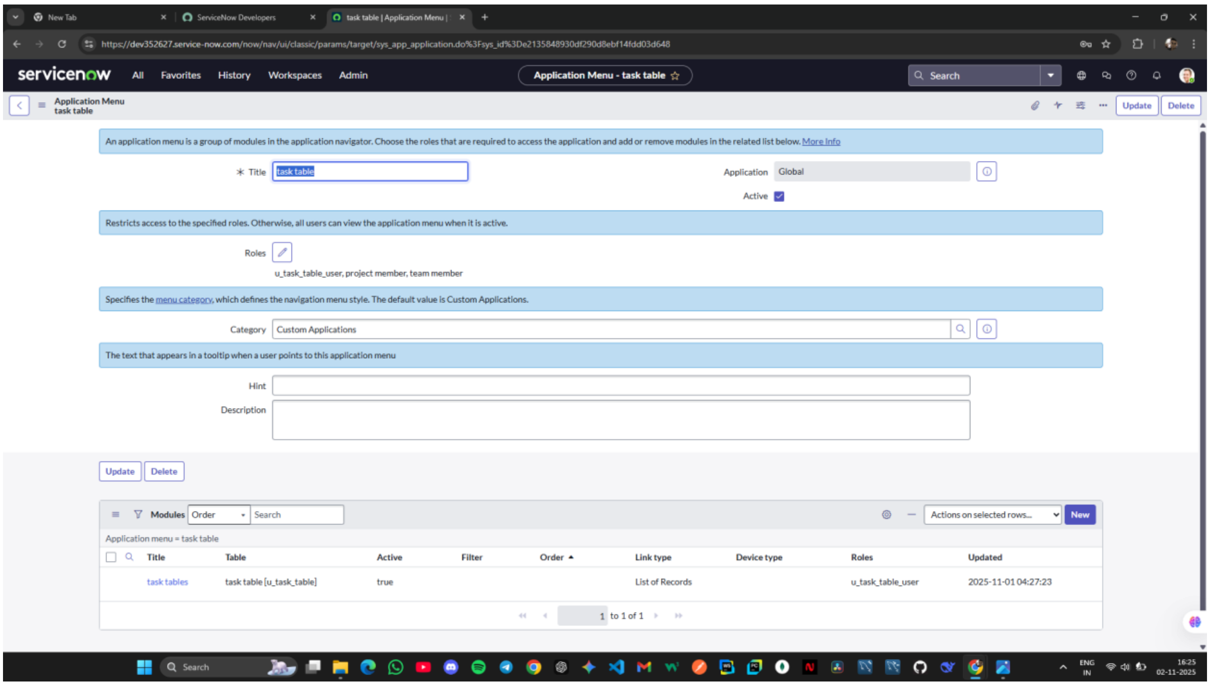
Hint:

Description:

Application menu = project table

Title	Table	Active	Filter	Order	Link type	Device type	Roles	Updated
project tables	project table [u_project_table]	true			List of Records		u_project_table_user	2025-11-01 04:32:52

1 to 1 of 1



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3De2135848930df290d8ebf14fdd03d648

Application Menu - task table

Application Menu
task table

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. More Info

* Title	task table	Application	Global
		Active	☑

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles: u_task_table_user, project member, team member

Specifies the menu category, which defines the navigation menu style. The default value is Custom Applications.

Category: Custom Applications

The text that appears in a tooltip when a user points to this application menu

Hint:

Description:

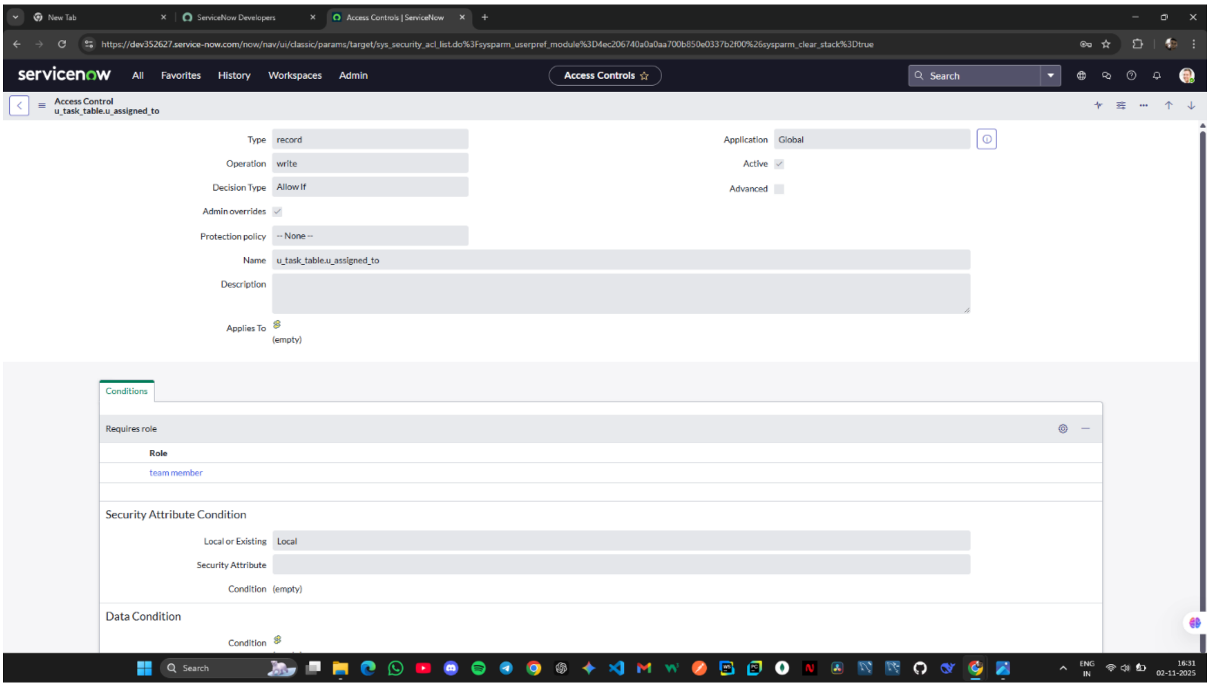
Modules

Application menu = task table

Title	Table	Active	Filter	Order	Link type	Device type	Roles	Updated
task tables	task table [u_task_table]	true			List of Records		u_task_table_user	2025-11-01 04:27:23

1 to 1 of 1

STEP 7: CREATE ACL



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_security_acl_list.do%3Fsysparm_userpref_module%3D4ec206740a0a0aa700b850e0337b2f00%26sysparm_clear_stack%3Dtrue

Access Controls

Access Control
u_task_table.u_assigned_to

Type	record	Application	Global
Operation	write	Active	☑
Decision Type	Allow If	Advanced	□
Admin overrides	☑		
Protection policy	-- None --		
Name	u_task_table.u_assigned_to		
Description			
Applies To	(empty)		

Conditions

Requires role

Role
team member

Security Attribute Condition

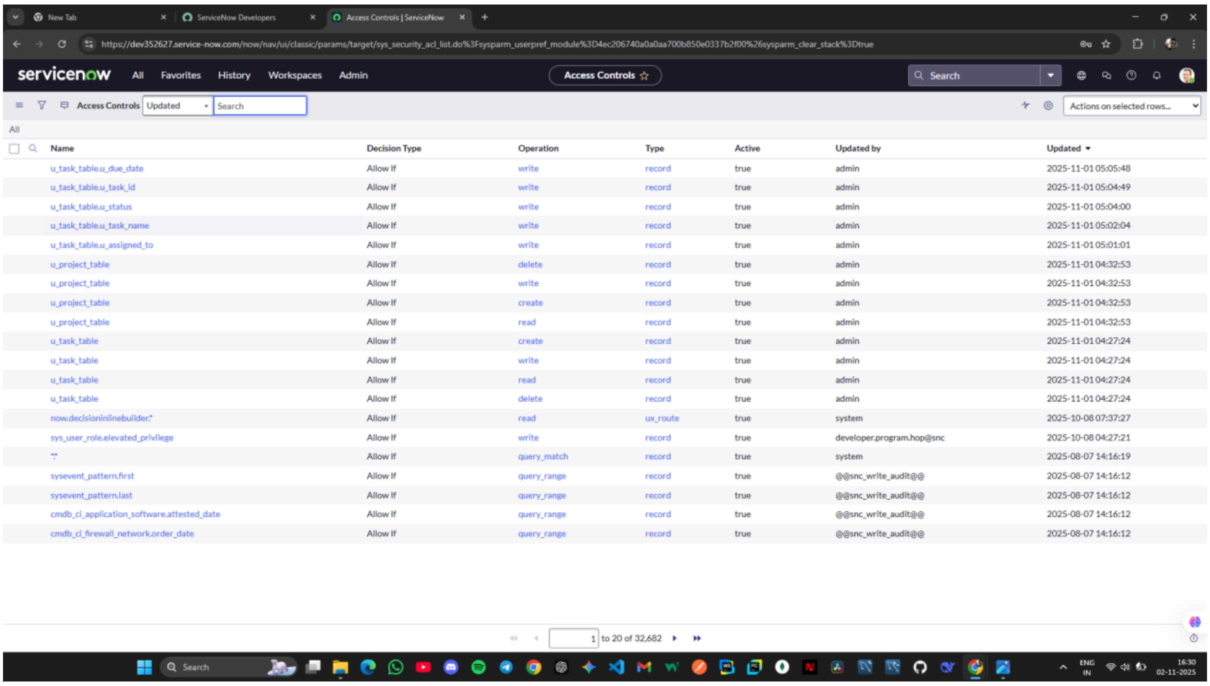
Local or Existing: Local

Security Attribute:

Condition: (empty)

Data Condition

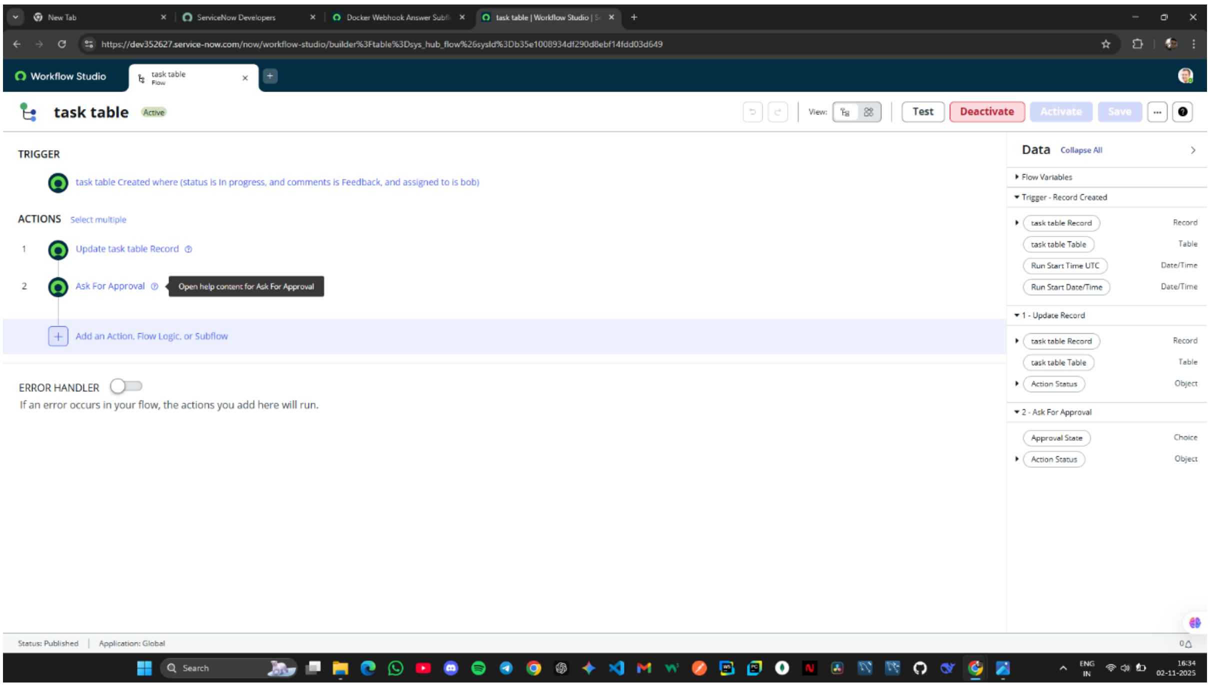
Condition



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sys_security_acl_list.do%3Fsysparm_userpref_module%3D4ec206740a0a0aa700b850e0337b2f00%26sysparm_clear_stack%3Dtrue
servicenow
All
Favorites
History
Workspaces
Admin
Access Controls
Search
Access Controls
Updated
Search
Actions on selected rows...
All
1 to 20 of 32,682

Name	Decision Type	Operation	Type	Active	Updated by	Updated
u_task_table.u_due_date	Allow If	write	record	true	admin	2025-11-01 05:05:48
u_task_table.u_task_id	Allow If	write	record	true	admin	2025-11-01 05:04:49
u_task_table.u_status	Allow If	write	record	true	admin	2025-11-01 05:04:00
u_task_table.u_task_name	Allow If	write	record	true	admin	2025-11-01 05:02:04
u_task_table.u_assigned_to	Allow If	write	record	true	admin	2025-11-01 05:01:01
u_project_table	Allow If	delete	record	true	admin	2025-11-01 04:32:53
u_project_table	Allow If	write	record	true	admin	2025-11-01 04:32:53
u_project_table	Allow If	create	record	true	admin	2025-11-01 04:32:53
u_project_table	Allow If	read	record	true	admin	2025-11-01 04:32:53
u_task_table	Allow If	create	record	true	admin	2025-11-01 04:27:24
u_task_table	Allow If	write	record	true	admin	2025-11-01 04:27:24
u_task_table	Allow If	read	record	true	admin	2025-11-01 04:27:24
u_task_table	Allow If	delete	record	true	admin	2025-11-01 04:27:24
now.decisioninlinebuilder.*	Allow If	read	ux_route	true	system	2025-10-08 07:37:27
sys_user_role.elevated_privilege	Allow If	write	record	true	developer.program.hop@snc	2025-10-08 04:27:21
.	Allow If	query_match	record	true	system	2025-08-07 14:16:19
sysevent_pattern.first	Allow If	query_range	record	true	@@snc_write_audit@@	2025-08-07 14:16:12
sysevent_pattern.last	Allow If	query_range	record	true	@@snc_write_audit@@	2025-08-07 14:16:12
cmdb_ci_application_software.attested_date	Allow If	query_range	record	true	@@snc_write_audit@@	2025-08-07 14:16:12
cmdb_ci_firewall_network.order_date	Allow If	query_range	record	true	@@snc_write_audit@@	2025-08-07 14:16:12

STEP 8: FLOW & OUTPUTS



New Tab
ServiceNow Developers
Docker Webhook Answer Subfl
task table | Workflow Studio | S
https://dev352627.service-now.com/now/workflow-studio/builder%3Ftable%3Dsys_hub_flow%26sysId%3Db35e1008934df290d8ebf14fdd03d649
Workflow Studio
task table
Flow
View:
Test
Deactivate
Activate
Save
Status: Published
Application: Global

task table Active

TRIGGER

task table Created where (status is In progress, and comments is Feedback, and assigned to is bob)

ACTIONS Select multiple

1 Update task table Record

2 Ask For Approval

Open help content for Ask For Approval

Add an Action, Flow Logic, or Subflow

ERROR HANDLER

If an error occurs in your flow, the actions you add here will run.

Data Collapse All

Flow Variables

Trigger - Record Created

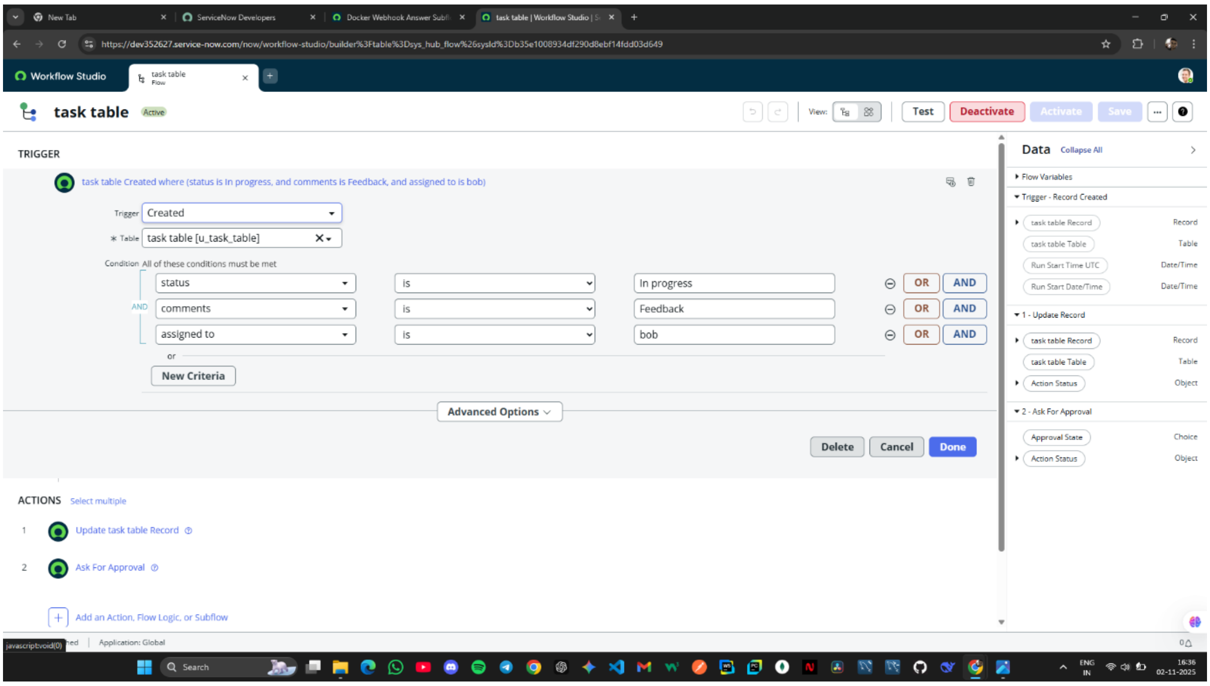
task table Record	Record
task table Table	Table
Run Start Time UTC	Date/Time
Run Start Date/Time	Date/Time

1 - Update Record

task table Record	Record
task table Table	Table
Action Status	Object

2 - Ask For Approval

Approval State	Choice
Action Status	Object



task table Active

TRIGGER

task table Created where (status is In progress, and comments is Feedback, and assigned to is bob)

Trigger: Created

Table: task table [u_task_table]

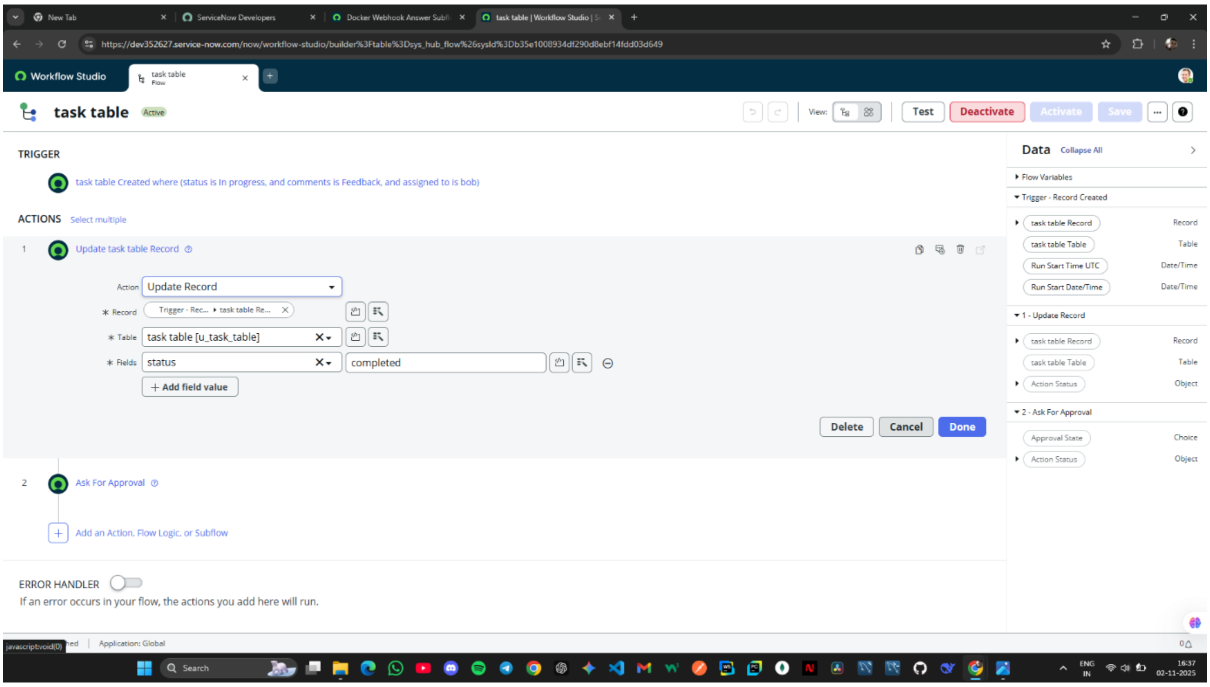
Condition: All of these conditions must be met

status	is	In progress
comments	is	Feedback
assigned to	is	bob

ACTIONS

1 Update task table Record

2 Ask For Approval



task table Active

TRIGGER

task table Created where (status is In progress, and comments is Feedback, and assigned to is bob)

ACTIONS

1 Update task table Record

Action: Update Record

Record: Trigger - Rec... ▸ task table Re...

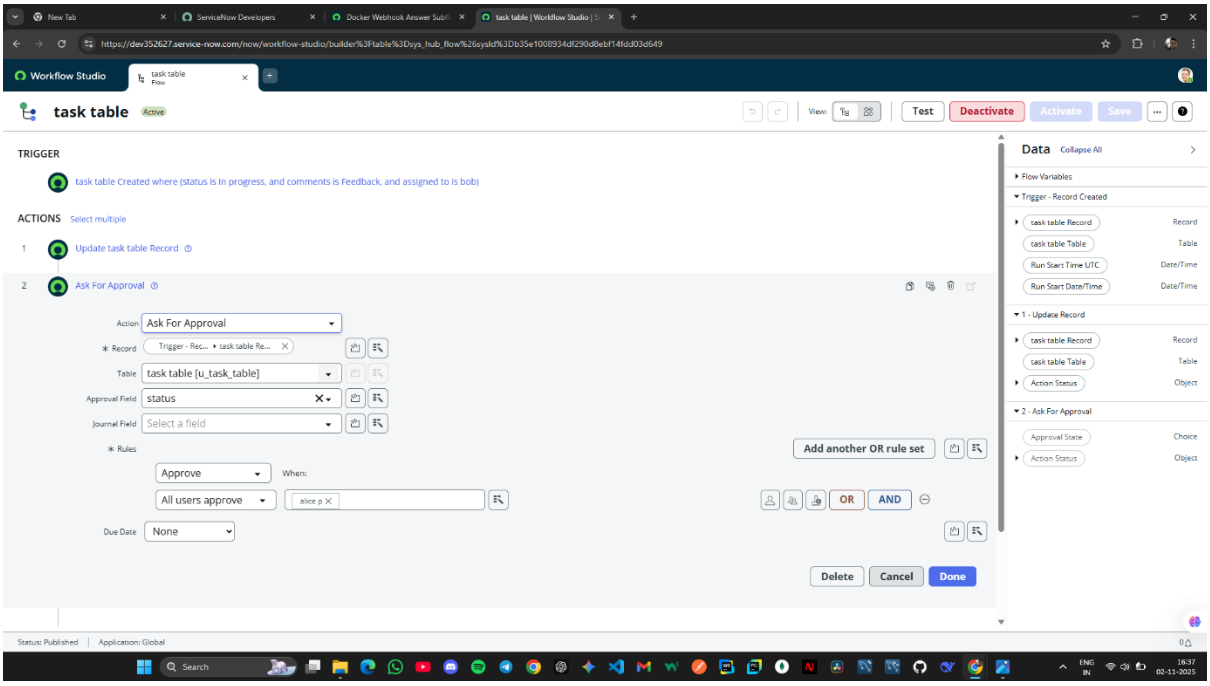
Table: task table [u_task_table]

Fields: status — completed

2 Ask For Approval

ERROR HANDLER

If an error occurs in your flow, the actions you add here will run.



https://dev352627.service-now.com/now/workflow-studio/builder%3Ftable%3Dsys_hub_flow%26sysId%3Db35e1008934df290d8ebf14fdd03d649

task table Active

TRIGGER

task table Created where (status is In progress, and comments is Feedback, and assigned to is bob)

ACTIONS Select multiple

1 Update task table Record

2 Ask For Approval

Action: Ask For Approval

* Record: Trigger - Rec... ▸ task table Re...

Table: task table [u_task_table]

Approval Field: status

Journal Field: Select a field

* Rules

Approve When:

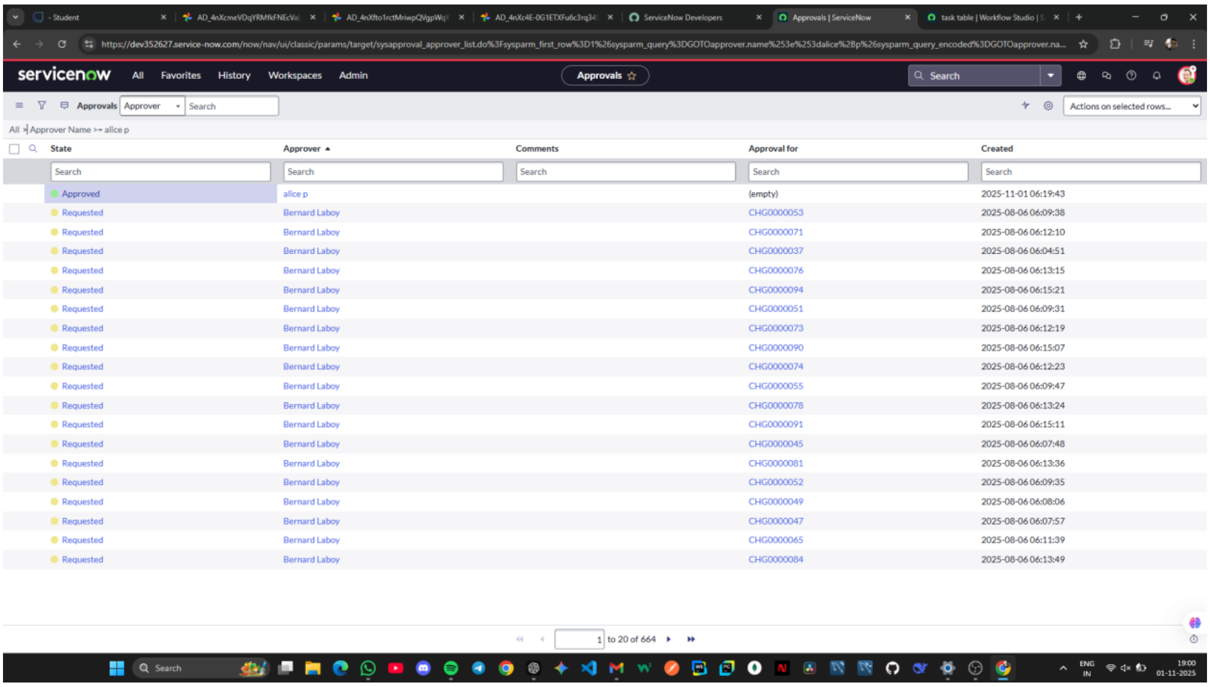
All users approve: alice p

Due Date: None

Data

- Flow Variables
- Trigger - Record Created
  - task table Record — Record
  - task table Table — Table
  - Run Start Time UTC — Date/Time
  - Run Start Date/Time — Date/Time
- 1 - Update Record
  - task table Record — Record
  - task table Table — Table
  - Action Status — Object
- 2 - Ask For Approval
  - Approval State — Choice
  - Action Status — Object

Status: Published | Application: Global



https://dev352627.service-now.com/now/nav/ui/classic/params/target/sysapproval_approver_list.do%3Fsysparm_first_row%3D1%26sysparm_query%3DGOTOapprover.name%253e%253dalice%2Bp%26sysparm_query_encoded%3DGOTOapprover.na...

Approvals

All > Approver Name >= alice p

State	Approver	Comments	Approval for	Created
Approved	alice p		(empty)	2025-11-01 06:19:43
Requested	Bernard Laboy		CHG0000053	2025-08-06 06:09:38
Requested	Bernard Laboy		CHG0000071	2025-08-06 06:12:10
Requested	Bernard Laboy		CHG0000037	2025-08-06 06:04:51
Requested	Bernard Laboy		CHG0000076	2025-08-06 06:13:15
Requested	Bernard Laboy		CHG0000094	2025-08-06 06:15:21
Requested	Bernard Laboy		CHG0000051	2025-08-06 06:09:31
Requested	Bernard Laboy		CHG0000073	2025-08-06 06:12:19
Requested	Bernard Laboy		CHG0000090	2025-08-06 06:15:07
Requested	Bernard Laboy		CHG0000074	2025-08-06 06:12:23
Requested	Bernard Laboy		CHG0000055	2025-08-06 06:09:47
Requested	Bernard Laboy		CHG0000078	2025-08-06 06:13:24
Requested	Bernard Laboy		CHG0000091	2025-08-06 06:15:11
Requested	Bernard Laboy		CHG0000045	2025-08-06 06:07:48
Requested	Bernard Laboy		CHG0000081	2025-08-06 06:13:36
Requested	Bernard Laboy		CHG0000052	2025-08-06 06:09:35
Requested	Bernard Laboy		CHG0000049	2025-08-06 06:08:06
Requested	Bernard Laboy		CHG0000047	2025-08-06 06:07:57
Requested	Bernard Laboy		CHG0000065	2025-08-06 06:11:39
Requested	Bernard Laboy		CHG0000084	2025-08-06 06:13:49

1 to 20 of 664

Outcome :

The system successfully automates *user and role management* within ServiceNow.

It enhances *security, **reduces administrative workload*, and ensures that every user has appropriate access.

The workflow-based automation:

* Reduces manual intervention

* Improves data security

* Provides clear audit trails

* Increases organizational efficiency

Conclusion:

The project *"Optimizing User, Group, and Role Management with Access Control and Workflows"* demonstrates how automation and access control can greatly improve IT service management.

By leveraging *ServiceNow's automation tools, ACLs, and workflows*, the project ensures:

* Streamlined access management

* Enhanced data protection

* Reduced operational effort

* Consistent workflow execution

This implementation highlights the power of combining *security with automation* for modern enterprise management systems.